

CLAIM OR CLAIMS

WHAT IS CLAIMED IS:

1. A filter having a variable passband comprising:

5 a filter circuit having as inputs a signal to be filtered (a forward signal)
and a reverse version of the signal to be filtered (a reverse signal), and
having as an output a filtered signal as a function of a variable coefficient; and
a variable equivalent sample rate coefficient converter having an initial
coefficient as an input together with a variable resampling rate parameter that
10 determines the variable passband, and providing as an output the variable
coefficient as a function of the variable resampling rate parameter.

2. The filter as recited in claim 1 wherein the filter circuit comprises:

 a first IIR filter having the forward signal and the variable coefficient as
15 inputs, and providing as an output a first filtered signal;
 a second IIR filter having the reverse signal and the variable coefficient
as inputs, and providing as an output a second filtered signal; and
 means for combining the first and second filtered signals with the
forward signal to provide the filtered signal.

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3. The filter as recited in claim 2 wherein the combining means comprises a
summing circuit having as inputs the first and second filtered signals and the
forward signal, and providing as an output the filtered signal.

4. The filter as recited in claim 3 wherein each IIR filter comprises:

a gain stage having an input coupled to receive an input signal, and providing an output in response to a gain component of the variable coefficient; and

5 a decay stage having an input coupled to the output of the gain stage, and providing as an output a filtered input signal in response to a decay component of the variable coefficient.

5. The filter as recited in claim 4 wherein the variable equivalent sample rate coefficient converter comprises:

10 an asymmetric variable equivalent sample rate coefficient converter having as inputs the variable resampling parameter and a gain component of the initial coefficient, and providing as an output the gain component of the variable coefficient; and

15 a symmetric variable equivalent sample rate coefficient converter having as inputs the variable resampling parameter and a decay component of the initial coefficient, and providing as an output the decay component of the variable coefficient.

20 6. The filter as recited in claim 2 wherein the combining means comprises:

an input multiplier having as inputs the forward signal and an all pass gain coefficient derived from the variable coefficient and the variable resampling rate parameter, and providing an output;

a summing circuit having as inputs the first and second filtered signals

and the output from the input multiplier, and providing as an output a preliminary filtered signal; and

an output multiplier having as inputs the preliminary filtered signal and a gain correction coefficient to provide overall gain for the filter, and providing
5 as an output the filtered signal.

7. The filter as recited in claims 2 or 6 wherein the variable coefficient input to the first and second IIR filters is a decay component of the variable coefficient.